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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/897,624	07/02/2001	Marilyn I. Wright	2000.070500	2250

23720 7590 06/04/2003

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EXAMINER

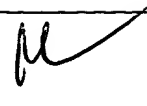
FOONG, SUK SAN

ART UNIT	PAPER NUMBER
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2823

DATE MAILED: 06/04/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/897,624	Applicant(s) WRIGHT, MARILYN I. 	
	Examiner Suk-San Foong	Art Unit 2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-47 is/are pending in the application.
- 4a) Of the above claim(s) 27-47 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☐ Claim(s) 1-26 is/are rejected.
- 7) ☒ Claim(s) 10, 18 and 26 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 July 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|-----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>3, 4</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group I, claims 1-26, in Paper No. 6 is acknowledged. The traversal is on the ground(s) that claims 45-47 are linking claims. This is not found persuasive because the reasons for distinctness have already been given. Claims 45-47 stands withdrawn from consideration.

The requirement is still deemed proper and is therefore made FINAL.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "125" and "130" have both been used to designate photoresist layer in Fig.

1. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

3. Claims 10, 18 and 26 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. It appears that claim 10, for example, labels one of the measurements of claims and as such does not limit the manipulative step of claim 1.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 3-5, 12-14 and 20-22 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. There is no description of the specification as originally filed of determining at least one parameter of an operating recipe of a polishing tool adapted to polish a subsequent wafer based on the reflection profile generically. There is only seen description of determining at least one parameter of an operating recipe of a polishing tool adapted to polish a subsequent wafer, comprising a step height and a layer deposited on the step having critical dimension variation as a result of being deposited on the step, based on the determined critical dimension variation measurement. (See MPEP 2163).

6. Claims 3-5, 12-14 and 20-22 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. There is insufficient guidance to enable one in the ordinary skill of the art to determine at least one parameter of an

operating recipe of a polishing tool adapted to polish a subsequent wafer based on the reflection profile; as recited in claim 3 broadly. There is only seen enablement for a process comprising determining at least one parameter of an operating recipe of a polishing tool adapted to polish a subsequent wafer, comprising a step height and a layer deposited on the step having critical dimension variation as a result of being deposited on the step, based on the determined critical dimension variation measurement. (See MPEP 2163).

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 21 and 22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

9. Claim 21 recites the limitation "the operating recipe" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim. It appears that "19" should be replaced by--20--.

10. Claim 22 recites the limitation "the at least one parameter" in line 1. There is insufficient antecedent basis for this limitation in the claim. It appears that "19" should be replaced by--21--.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

13. Claims 1, 2, 6, 8-11, 15, 17-19, 23, 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fairbairn et al. (2002/0155629) in combination with Applicant Admitted Prior Art (AAPA).

Fairbairn et al. discloses a method of monitoring and controlling critical dimension (CD) variation which includes providing wafer, W, with feature such as transistor gate (Paragraphs [0029, 0038, 0039], and Fig. 4A), then examining the feature on wafer W using an optical inspection tool such as one described in Conrad et al. (5,963,329) (Paragraph [0034]), then obtaining a waveform such as profile of the feature (Paragraph [0039]), subsequently comparing the obtained profile to a golden profile (target) (Paragraph [0039]), then comparing the obtained profile to a library of reference reflection profiles with critical dimension variation metric associated with each waveforms (Paragraphs [0030, 0038, 0040, 0043]), subsequently

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identifying and selecting a reference profile most closely matching the obtained profile in the event that the obtained profile does not match the golden profile (Paragraph [0040]), and then determining the critical dimension variation metric associated with the selected reference profile (Paragraph [0041]). Conrad et al. discloses a method of measuring line profile formed a semiconductor substrate which includes providing grating structure 12 over substrate 13 (Col. 7, lines 60-65, and Fig. 9), then illuminating grating structure 12 with light source 10, then measuring light intensity reflected from grating structure 12 (Col. 7, line 65 to Col. 8, line 14), and subsequently generating a reflection profile (Col. 2, lines 41-42, Col. 4, lines 54-58, Col. 5, lines 1-8, and Col. 10, lines 36-40).

Fairbairn does not teach providing grating structure comprising a plurality of lines on the wafer.

APPA discloses a method of forming transistors on a semiconductor wafer which includes providing gate electrodes 135 having grating structure with plurality of lines on the semiconductor wafer (Instant Fig. 1).

It would have been within the scope to one ordinary skill in the art to combine the teachings of Fairbairn with the teachings of AAPA because it would enable formation of transistors on the wafer of Fairbairn to be performed.

14. Claims 7, 16 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fairbairn et al. (2002/0155629) in combination with AAPA as applied to claims 1, 2, 6, 8-11, 15, 17-19, 23, 25 and 26 above, and further in view of Mazor et al. ('652).

The combination process does not teach the step as recited in claim 7.

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Mazor et al. discloses a method of measuring critical dimensions on a semiconductor wafer which includes providing test pattern 22 comprise of grating structure 26 formed in a scribe line 24 (or test structure as disclosed in instant specification p. 9, line 25 to p. 10, line 2), on semiconductor wafer 20 (Col. 5, line 60 to Col. 6, line 25), and subsequently determining the critical dimension of grating structure 26 (Col. 6, line 36 to Col. 9, line 34).

It would have been within the scope to one ordinary skill in the art to combine the teachings of the combination process with Mazor et al. because it would enable formation of the grating structure of the combination process to be performed and obtain further advantage of minimizing the loss of useful space on the wafer (Mazor et al., Col. 6, lines 8-10).

Allowable Subject Matter

15. Claims limited to the process of claim 1 and determining at least one parameter of an operating recipe of a polishing tool adapted to polish a shallow trench isolation region having a step height on a subsequent wafer based on the determined critical dimension variation measurement would be allowable.

Double Patenting

16. Applicant is advised that should claim 2 be found allowable, claim 11 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight

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difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

17. Applicant is advised that should claim 9 be found allowable, claim 19 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Conclusion

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. 2002/0090744 discloses forming test patterns in test structure. 2002/01929966 provides feedback control for processing subsequent wafers such as adjusting CMP recipe based on information detected by a sensor tool. 2002/0072001 teaches reducing critical dimension variation within a wafer by altering at least one parameter of a processing module.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Suk-San Foong whose telephone number is 703-305-0383. The examiner can normally be reached on Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on 703-306-2794. The fax phone numbers for the


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organization where this application or proceeding is assigned are 703-308-7722 (7724, 3431, 3432).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

SK

May 30, 2003


George Hourson
Primary Examiner
Art Unit 2823